No. of Printed pages: **02**

**SEAT No._____**

[17 & A-13] **SARDAR PATEL UNIVERSITY**

**BBA (GENERAL) SEMESTER-III EXAMINATION**

**MONDAY, 27TH NOVEMBER**

**2017**

**02.00 P.M. TO 04.00 P.M.**

**UM03CBBA06: STATISTICS FOR MANAGEMENT-I**

**Total Marks: 60**

**Note:** Graph papers & statistical table will be provided on request.

**Q.1** **[a]** Define primary and secondary data. List out sources of secondary data. **[07]**

**[b]** The following distribution gives the pattern of overtime work done by 100 employees of the company. Find the mean, standard deviation and coefficient of variation. **[08]**

| Class | 10-15 | 15-20 | 20-25 | 25-30 | 30-35 | 35-40 |
|---|---|---|---|---|---|---|
| Frequency | 11 | 20 | 35 | 20 | 8 | 6 |

**OR**

**Q.1** **[a]** If the median of the following frequency distribution is 38, find the missing frequencies of classes 30-40 and 50-60. **[07]**

| Class | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 | Total |
|---|---|---|---|---|---|---|---|---|
| Frequency | 42 | 38 | $f_1$ | 54 | $f_2$ | 36 | 32 | 400 |

**[b]** The life time (in thousand) of 10 LED bulbs of two company A and B were recorded as given below. Find out which of the two shows greater lifetime and fluctuation. **[08]**

| Company A | 17 | 20 | 19 | 18 | 16 | 18 | 17 | 19 | 20 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|
| Company B | 16 | 15 | 19 | 20 | 17 | 19 | 20 | 20 | 14 | 20 |

**Q.2** **[a]** State and prove addition theorem of probability for two events. **[07]**

**[b]** Students A, B and C are given an example to solve independently. The probabilities that they will solve the example correctly are respectively $\frac{1}{2}$, $\frac{1}{3}$ and $\frac{3}{4}$. Find the probabilities that at least one of them will solve the example correctly. **[08]**

**OR**

**Q.2** **[a]** A Chartered Accountant applies for a job in two firms X and Y. He estimates that the probability of his being selected in firms X is 0.7, and being rejected at Y is 0.5 and the probability of at least one of his applications being rejected is 0.6. What is the probability that he will be selected in one of the firm? **[07]**

**[b]** A random variable X has the following probability distribution, **[08]**

| Value of X : | -1 | 0 | 1 | 2 | 3 |
|---|---|---|---|---|---|
| P(X) : | 0.2 | 0.2 | 2a | 0.3 | a |

Determine the value of $a$, $E(x)$ and $V(x)$.

C.P. T.O.)

**Q.3** **[a]** Write properties Normal distribution. **[07]**

**[b]** If a random variable X follow Poisson distribution such that $P(X = 1) = P(X = 2)$. Find (i) The mean and variance of the distribution (*ii*) $P(X = 0)$ (*iii*) $P(X < 2)$ **[08]**

**OR**

**Q.3** **[a]** The probability of a randomly selected student will not graduate is 0.4. Determine the probability that out of 5 students: (i) none, (ii) one (iii) at most one (iv) all will graduate. **[07]**

**[b]** The weight of 1000 students is follow normal distribution with mean 50 kg and standard deviation 2.5 kg. Find the number of students having weight (i) more than 55 kg (ii) less than 45 kg (iii) between 45 and 55 kg. **[08]**

**Q.4** **[a]** Write a short note on causes of variation in a production process. **[05]**

**[b]** Twelve samples of five items each were taken on a random sample basis. Draw mean and range chart and write your comment on the state of the control of the process. [$n = 5$, $A_2 = 0.58, D_3 = 0, D_4 = 2.115$ ] **[10]**

| Sample no. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean ($\bar{x}$) | 120 | 130 | 103 | 120 | 130 | 140 | 112 | 105 | 103 | 140 | 125 | 116 |
| Range (R) | 12 | 13 | 14 | 12 | 11 | 13 | 12 | 16 | 14 | 12 | 13 | 12 |

**OR**

**Q.4** **[a]** The following figures give the number of defectives in twelve samples, each sample containing 200 items. **[07]**

25 30 16 41 25 22 80 60 37 50 56 20

Draw p-chart and comment.

**[b]** During an examination of equal lengths of cloth, the following is the number of defects observed: **[08]**

2 1 2 1 2 1 3 4 0 5 6 7 4 3 2

Draw a control chart for the number of defects and comment whether the process is under control or not.